

CI 38900

**Opsym-Incumbent Generation Dispatch Modeling
Tool**

REDACTED

July 30, 2010

NOVA SCOTIA
POWER
An Emera Company

UARB APPROVAL SHEET

Project Title: **Opsym-Incumbent Generation Dispatch Modeling Tool**

CI Number: 38900

☒ Capital Project Authorization

Head Office Use:

☐ ATO

Project Number: P813

☐ Final Cost

Date: July 30, 2010

Location:			Division:	
Expenditure Profile			Schedule	
YEAR	Budget Estimate	Project Estimate		
2010	988,123	959,107	Estimated Start Date	2010-05
			Estimated in-Service Date	2010-09
			Estimated Close Date	2010-09
Total	\$988,123	\$959,107		

COMMENTS

Submitted on behalf of NOVA SCOTIA POWER INCORPORATED

Approved on behalf of NOVA SCOTIA UTILITY AND REVIEW BOARD

M Savory

July 24/2010

Authorized Signatory

DATE

DATE

Mark Savory

VP Technical and Construction

CI Number : 38900-P813

Project Number P813

- Opsym-Incumbent Generation Dispatch Modeling Tool

Parent CI Number :

Budget Version - 2010 06/06 Forecast

Cost Centre : 389 - 389-Energy Fuels & Risk Mgmt.

Forecast

Start :	05/01/2010
Operational :	09/30/2010
Final Cost :	09/30/2010
2010	\$959,106.74
Total :	\$959,106.74
Original Cost :	\$0.00

This project is required to address the functional and technical concerns of the incumbent generation dispatch modeling tool (Opsym/Prosym) used by the NSP 24/7 Power Desk. The project consists of the procurement, planning, installation, configuration, and deployment of the generation optimization solution.

Summary of Related CI's +/- 2 years
No other projects in 2008,2009,2010,2011 and 2012

CI Number : 38900-P813	- Opsym	Project Number	P813
Parent CI Number :	-	Approved Date	4/30/2010
Cost Centre : 389	- 389-Energy Fuels & Risk Mgmt.		

Capital Item Justification

Justification Criteria : WORK SUPPORT FACILITIES

Sub-Criteria : <Select a value>

Name of Report :

Document Location :

Person Responsible :

Why do this project?

This project is required to address the functional and technical concerns of the incumbent generation dispatch modeling tool. The 2008 Technical Asset Review identified Opsym as an overall high risk due to underlying business risks. These risks are being mitigated with manual intervention using currently available personnel. This has reduced the overall risk exposure, but is not sustainable. A loss of the Opsym application could result in inaccurate real time pricing valuations, or non-optimal fleet dispatch scenarios. A loss of the Opsym application would result in commercial operations being unable to produce the daily Northeast Power Coordinating Council adequacy report for the regional control authority. This is a North American Electric Reliability Corporation requirement.

The risk rating is 'high' because the application functionality and scalability does not meet current and anticipated requirements (renewables accountability, Fuel Adjustment Mechanism constraints, etc)

Why do this project now?

NSPI is subject to an ever-changing set of requirements relating to how it manages power inputs and outputs relating to energy. This includes renewable energy legislation, the Fuel Adjustment Mechanism, new fuel sources, power market conditions. NSPI needs a robust solution to meet the analytical, management, reporting, and transparency requirements of this critical part of the business.

Why do this project this way?

A generation dispatch modeling solution is delivered through software deployed at the generation manager's site (NSPI). The proposed solution is aligned with vendor experience best practices.

CI Number : 38900-P813	- Opsym	Project Number	P813
Parent CI Number :	-	Approved Date	4/30/2010
Cost Centre : 389	- 389-Energy Fuels & Risk Mgmt.		

Reason for Variance / Over Expenditure / Final Costing

14816401

The variance between ACE 2010 and the revised submission is due to the estimate being updated since ACE 2010.

CI Number : 38900-P813

- Opsym-Incumbent Generation Dispatch Modeling Tool

Project Number P813

Parent CI Number :

-

Approved Date

4/30/2010

Cost Centre : 389

- 389-Energy Fuels & Risk Mgmt.

Budget Version

2010 06/06 Forecast

Capital Item Accounts

Acct	Actv	Account	Activity	Forecast Amount	Amount	Variance
092		092-Vehicle T&D Reg. Labour AO		11,363	0	11,363
094		094 - Interest Capitalized		11,884	0	11,884
095		095-IT Regular Labour AO		14,596	0	14,596
095		095-COPS Regular Labour AO		39,248	0	39,248
001	004	001 - T&D Regular Labour	004 - HGP - Misc.Equipment	49,600	0	49,600
001	004	001 - IT Regular Labour	004 - HGP - Misc.Equipment	34,400	0	34,400
011	004	011 - Travel Expense	004 - HGP - Misc.Equipment	10,540	0	10,540
028	004	028 - Consulting	004 - HGP - Misc.Equipment	330,960	0	330,960
028	004	028 - Consulting	004 - GP - Misc.Equipment	71,044	0	71,044
034	004	034 - Appl. Software	004 - HGP - Misc.Equipment	0	0	0
034	004	034 - Appl. Software	004 - GP - Misc.Equipment	354,488	0	354,488
035	004	035 - Comp.Hrdwr & Op.Sftwr	004 - HGP - Misc.Equipment	30,000	0	30,000
041	004	041 - Meals & Entertainment	004 - GP - Misc.Equipment	134	0	134
041	004	041 - Meals & Entertainment	004 - HGP - Misc.Equipment	850	0	850
Total Cost:				959,107	0	959,107
Original Cost:						

Project Cost Estimate							
FP#:		38900					
Title		Opsym-Incumbent Generation Dispatch Modeling Tool					
Item	Description	Acct	Actv	Unit	Quantity	Unit Price	Total
1	Supply of Materials						
1.1	License Fee			One Time	1		\$
Sub-Total							\$
2	Equipment Rental & Charges						
2.1	Computer Hardware				1		\$
Sub-Total							\$
3	Plant Labour						
3.1	IT Department Regular Labour				1	49,500.00	\$ 34,400.00
3.2	Power Production Regular Labour				1	55,500.00	\$ 49,600.00
3.3	Meals and Entertainment				1	984.00	\$ 984.00
Sub-Total							\$ 84,984.00
4	Consulting						
4.1	Senior Management			Days	6.5		\$
4.2	Project Manager			Days	27		\$
4.3	Technical Consultant			Days	15		\$
4.4	Business Consultant			Days	115		\$
4.5	IT Consulting				1	40,033.00	\$ 40,033.00
4.6	Contract Contingency				1	12,000.00	\$ 12,000.00
Sub-Total							\$ 366,993.00
5	Engineering & Project Management						
5.1	Expenses				1		\$
5.2	NSPI Travel/Training Expenses				1		\$
Sub-Total							\$ 57,540.00
6	Indirect Costs						
6.1	Vehicle T&D Reg Labour AO	092			1		\$ 11,363.00
6.2	Interest Capitalized	094			1		\$ 11,884.00
6.3	IT Regular Labour AO	095			1		\$ 14,595.00
6.4	COPS Regular Labour AO	095			1		\$ 39,248.00
Sub-Total							\$ 77,090.00
Project Cost Estimate					Total	\$ 959,107.00	

This project has been activated.

Opsym Replacement "Gen Ops"
Reference Notes

Budget Year	2010
Division	General Plant
Department	Fuels

Date	May 18th 2010
CI number	38900

Note 1	License Fees	As per the Quote received from the supplier, the costs associated with the licensing of the new Gen Ops software is [REDACTED]. The exchange rate upon contract signing was at parity.
Note 2	Computer Hardware	The estimate for computer hardware was based on a pre existing contract between NSPI and CGI. The opsym replacement project requires 2 servers (one production, one test) each estimated at [REDACTED]. The corresponding attachment is the capital outlay for servers for the pre existing contract.
Note 3-7	Contracts	These amounts represent the supplier's costs associate with the implementation of the new EPM Gen Ops software. This covers all employees and travel at a cost of [REDACTED]

REDACTED

General Plant Responses

Request IR-GP19:

With respect to page 257, CI# 38900, Opsym-Incumbent Generation Dispatch Modeling Tool,

a) Please provide the report, study, and related correspondence that explain and justify this project.

b) Please provide a breakdown of the \$988,123 project cost estimate.

Response IR-GP19:

a) Please refer to Confidential Attachment 1 which identifies the risks this project will mitigate and justifies why the project is necessary. This Attachment is provided in redacted form. The investment profile for the project and risk assessment chart have been redacted. To protect value for customers and mitigate the risk of prospective proponents having access to project budget information, the future estimated costs for this project are confidential. All purchase orders and contracts for the application software have not yet been issued or finalized.

The more a supplier is aware of NSPI's specific requirements, the better their ability to obtain the highest price, reduce competition and ultimately increase the cost for NSPI and its customers. The cost of such transparency is not always immediately evident. Information from regulatory proceedings can provide competitive advantages over other suppliers, and that could be advantageous in bidding or negotiation. Higher prices, or avoidable contractual constraints, will result in unnecessary higher costs to customers.

Please refer to Confidential Attachment 2 which explains the characteristics of the new modeling tool and provides a price proposal for the asset. This attachment is confidential because the information included is the intellectual property of the consultant and was provided for the Company's sole and confidential use. Third party consultants and suppliers

REDACTED

Response IR-GP19: (cont'd)

have a reasonable expectation that their proprietary interests in the content or analysis will be protected from public disclosure. Disclosure of their pricing strategies may impair their ability to remain competitive in the marketplace.

b) Table 1 – Breakdown of Opsym-Incumbent Generation Dispatch Modeling Tool

Account	Estimate (\$)
Regular Labour	105,000
Consulting	
Application Software	
Computer Hardware & Ops Software	
Meals	1,000
Vehicle Allocated Costs	14,204
Interest	16,614
Indirect Costs	67,305
Total	988,123

To protect value for customers and mitigate the risk of prospective proponents having access to project budget information, the estimated costs for hardware, software and consulting are confidential. All purchase orders and contracts for these items have not yet been issued or finalized.

The more a supplier is aware of NSPI's specific requirements, the better their ability to obtain the highest price, reduce competition and ultimately increase the cost for NSPI and its customers. The cost of such transparency is not always immediately evident. Information from regulatory proceedings can provide competitive advantages over other suppliers, and that could be advantageous in bidding or negotiation. Higher prices, or avoidable contractual constraints, will result in unnecessary higher costs to customers.



Information Technology

Technology Asset Review

Opsym

MARCH 2008

Revision: Version 0.1

The Technology Asset Review (TAR) provides Asset Owners with a current state view of their asset, identifies risks of current state, makes recommendations on risk mitigation strategies, and acts as a planning tool for ongoing management of the asset.



Information Technology

Revision History

Document Information			
Version	Date	Author/Editor	Revision Notes
1.0	March 14, 2008	[REDACTED]	Version 1.0

Asset Review History

Report Date	Overall Risk Rating	Sign off by	Outcome
March 14, 2008	High		-
			-
			-

Asset Owner Sign Off

Sign Off	
Asset Owner	[REDACTED]
Title	Director, Fuels, Energy, and Risk
TAR Sign-off	[REDACTED]
Title	Team Lead, Scheduling and Plant Dispatch
I have read this Technology Asset Review. I understand the risks and risk mitigation recommendations listed in this report. _____ _____ _____ _____ _____ _____ _____ _____ _____ _____	
_____	_____
Date	Signature



Information Technology

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1. Introduction

Opsym is a Graphical User Interface (GUI) that allows for an intuitive interface into the Prosym evaluation model. Prosym is a complete electric utility/regional pool analysis and accounting system. It is designed to perform generation planning and fleet optimization operational studies and, as a result of its chronological structure, accommodates detailed hour-by-hour investigation into the operations of electric utilities and Power Pools.

The Opsym/Prosym application is employed by the Commercial Operations 24Hr Desk to derive an optimal constrained economic dispatch for Nova Scotia Power's generation fleet and also provide adequacy studies to the Independent System Operator (ISO). These functions are conducted on an hourly and day-ahead basis 24 hours a day, 7 days a week. A byproduct of these processes is the creation of an hourly marginal Real Time Price (RTP) which is used by certain rate classes and impacts the billing for those affected.

2. Executive Summary

The assessment performed during this review has rated the overall system risk as **High**.

The following risks were identified:

- **Potential revenue loss.** A loss of the Opsym application could result in inaccurate RTP valuations or non-optimal fleet dispatch scenarios, both situations could be revenue affecting. Energy trading activities could also be impacted. Scheduling and post dispatch reconciliation of Brooklyn Power would also not be possible.
- **Operating efficiency loss.** Without Opsym, hourly and day-ahead dispatch schedules would be difficult to produce, scheduling of Brooklyn Power would not be possible.
- **Regulatory Risk.** A loss of the Opsym application would result in Commercial Operations being unable to produce the daily NPCC adequacy report for the regional control authority. This is a NERC requirement. Commercial Operations would also be unable to accurately determine hourly and day-ahead RTP prices for Stora and Bowater, a UARB requirement.

The High risk rating is derived from the moderate probability of an Opsym issue and the major impact of an Opsym issue on NSP operations.

The major contributors to the High Risk rating are

- The system architecture relies on local workstations that constrains the ability to support, troubleshoot, and expand the system as required
- Application support is maintained in the business unit and not with NSP IT
- Application functionality and scalability does not meet current and anticipated requirements



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- There is no sustainable maintenance plan for mitigating the risk of system issues

These, along with other, contributing factors are detailed in Section 4.7, Top Issues with the Application.

NSP IT recommends the following to help mitigate the risk associated with the OPSYM environment:

- **Develop a technology investment strategy for generation dispatch.**
The business owner should identify its business requirements, the subsequent technology required to support these requirements, and develop an investment plan for consideration by NSP senior management.
- **Develop an Application Service Agreement for Opsym.**
Develop an Application Service Level Agreement (SLA) with NSP IT for support of the application.
- **Develop a Business Continuity Plan for Opsym-related business operations**
A Business Continuity Plan will provide contingency for circumstances when Opsym is not available.
- **Develop an operational maintenance plan for Opsym**
A series of regular scheduled system health checks should be developed to mitigate the risk of system failure.

3. Lifecycle Management Plan

3.1. Background Data

3.1.1. Scope Summary

This Technology Asset Review is meant to provide an evaluation of the IT assets associated with the Opsym environment. This includes the hardware and software for the production platforms (see details in Appendix E).

3.1.2. Assumptions for this Report

- No substantial changes are expected in the volume of data being collected in the next year other than normal growth in NSPI's customer base.
- No substantial changes are expected in business process or methods used to collect data.

3.1.3. Physical Parameters & Condition

The Opsym environment consists of two high performance HP WX 6200 desktop computers, one each for the Real-Time and Day-Ahead trading desks. The Opsym environment hardware currently meets the business requirements and is supported by NSP IT.



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All components of the Opsym application are locally installed on each machine. The Opsym database is machine specific and resides on the local hard disk; the data cannot be shared. This run specific operating model is no longer used by Opsym's replacement, EnerPrise Generation Management Resource Optimizer. The next generation of Opsym is a client server based .NET architecture, using a MicroSoft SQL database and is multi-user.

The Opsym application is currently supported by the vendor, Ventyx. Ventyx has advised that Opsym is no longer in the development queue and no further code fixes or enhancements will be made to this version. There are a number of business functions that the application does not currently provide (ex, the inclusion of transmission constraint modeling). Commercial Operations has developed workaround processes to account for these application deficiencies. The flat-file database model does not provide the benefit of the traditional database engine in that auditing, reporting, security and maintenance functionality is limited or non-existent.



The following table indicates the hardware, software, and other components associated with the asset and their currently installed models or versions. It also lists the vendor-preferred version and its recommended version for this asset. The Lifecycle column provides an overview of where the asset is in its expected lifecycle.

Asset State Information						
Module Or component	Current State	Risk	Vendor Recommended	IT Recommended	Comments Lifecycle	e/Asset value
Opsym Real-Time (RT) Desk PC	HP 3.2 GHz, 1GB Ram, 75GB Hard Drive, OS - Windows XP SP 2	Low Server	Server Environment	Server Environment	Opsym application currently running on a PC shared by 6 employees	3 of 4
Opsym Day-Ahead (DA) Desk PC	HP 3.2 GHz, 1GB Ram, 75GB Hard Drive, OS - Windows XP SP 2	Low	Server Environment	Server Environment	Opsym application currently running on a PC shared by 6 employees	3 of 4
Database No	database. Data is maintained as a collection of flat files.	High	Microsoft SQL 2000 Server	Microsoft SQL 2000 Server	None N/A	
Application Opsym	3.76.7	High	Generation Manager Resource Optimizer	Upgrade current application	None	6 of 6



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3.1.4. Service Levels

The Opsym infrastructure (workstations, operating systems) is supported to service levels defined in the NSP/CGI Infrastructure Support Agreement. There is no Application Service Level Agreement (SLA) with NSP IT for system support.

3.1.5. Asset Capacity / Performance

Opsym is constrained by the limited disk space available on the local workstations. The Opsym architecture maintains data files on the local workstation. These workstations routinely reach capacity and cause Opsym to crash and the PC to lock-up. These issues require reactive measures to allow Opsym related processing to continue.

Opsym processing includes a data retrieval routine that relies on a series of synchronized data processes. Network performance issues disrupt these synchronized processes and can cause data retrieval and simulation submittal to conflict, thus locking the application. Recovering Opsym after such events takes significant effort.

These issues contribute to a perception that the Opsym environment is not architected in accordance to its critical role in the business.

3.2. Routine Maintenance Plan

There is currently no routine maintenance plan for Opsym. From time to time, the accumulation of the studies tends to fill the local hard drives. When this becomes evident, these studies are archived to a network drive. Other issues are dealt with as they occur.

Both the Real Time and Day Ahead computers are standardized and supported by NSP's desktop service provider. Operating System patches are automatically installed when they become available.

3.3. Growth

Commercial Operations has Opsym installed on two machines (Real Time and Day Ahead trading desks) and is currently used by eight individuals. It is likely that this will increase as the group endeavors to incorporate Opsym in a post dispatch evaluation role.

3.4. Change in Use of the Asset

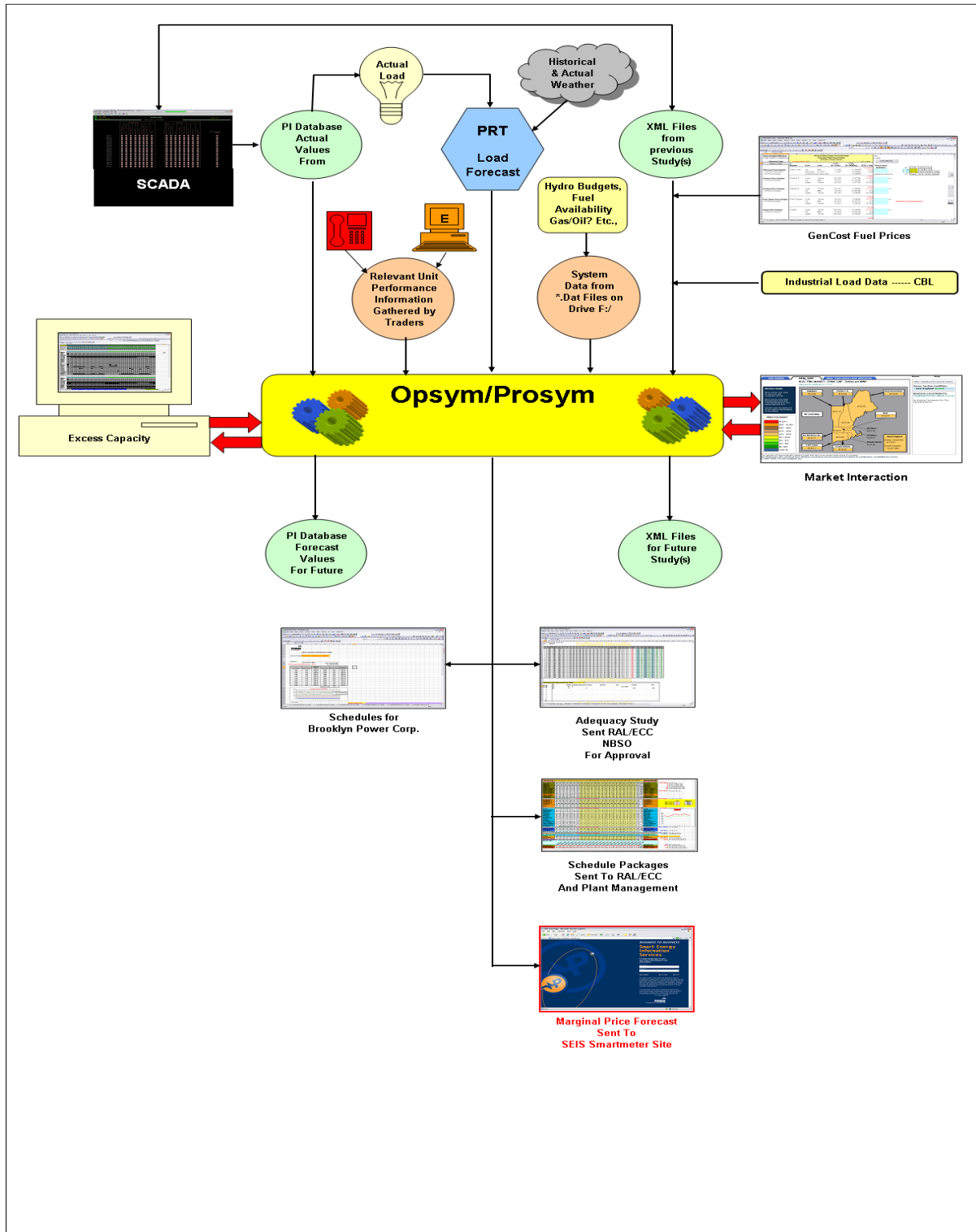
It is the intention of the Commercial Operations group to use Opsym in a post dispatch evaluation role and to also help determine NSPI's actual costs of production; this would be a net new use of the asset.

Today, Opsym study periods are a week or less in duration. Commercial Operations has indicated a desire to study periods that could range from one month to one year.



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The following diagram illustrates how Opsym is currently integrated to other systems:





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3.5.Renewal / Replacement Plan

The renewal and/or replacement of the Opsym application will be based on its ability to meet the business needs of NSPI's Commercial Operations group. A renewal or replacement initiative may be triggered by reliability concerns, change in the use of the asset, or a degradation in performance.

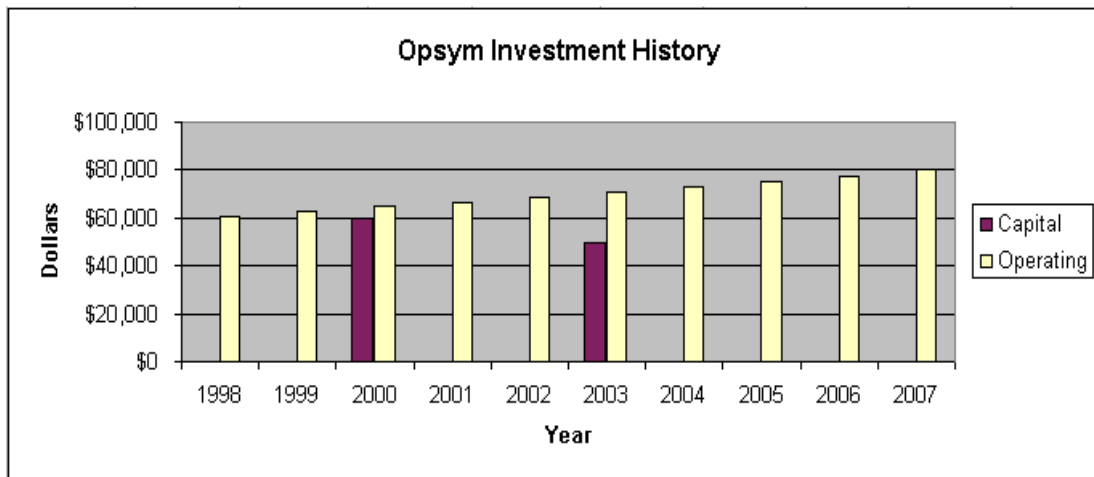
3.6.Asset Valuation

Opsym Val	ue
Install Cost	\$120,000
Install year	1997
Estimated Book Value	unknown
Replacement Value	\$252,000
Capital invested since installation	\$60,000
As a % of initial install	50%
% of install value invested per year	5%

Financial assumptions/notes:

- Historical capital investment numbers are anecdotal (no capital records exist)
- Capital investments that spanned multiple years are represented as a single-year spend, in the year the asset was declared "in service".
- Operating costs are based on vendor support costs. They do not include infrastructure support or depreciation.
- Operating costs are base lined for the current year and escalated/declined at 3% annually.
- Replacement value is calculated using the installed value, the number of years since installation and an appreciation rate.

3.7.Historical Investment



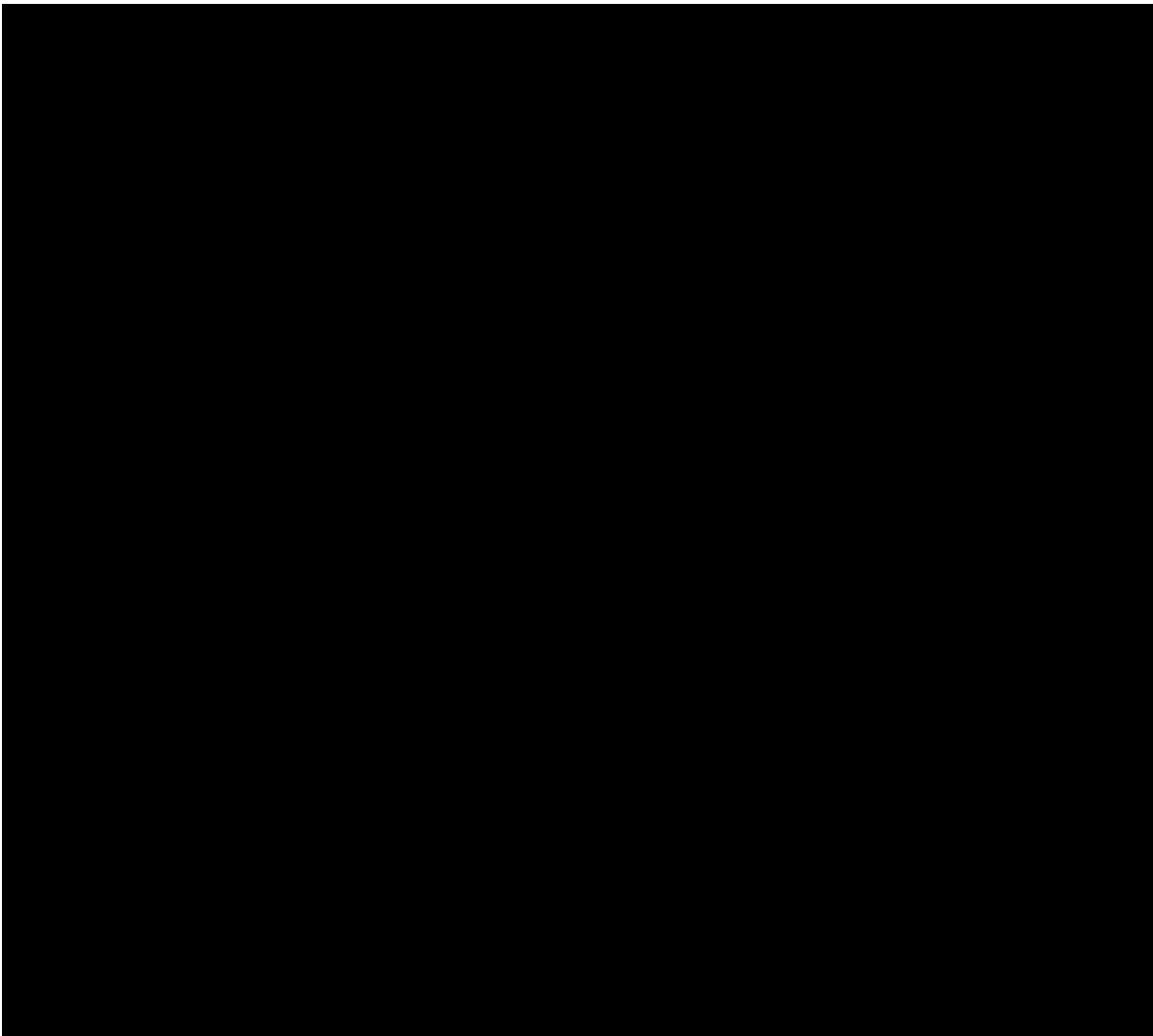


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10 Year Investment History

	Capital	% of Initial Cost	Operating %	of Initial Cost	Total Spend
1998 \$0		0%	\$60,818	51%	\$60,818
1999 \$0		0%	\$62,699	52%	\$62,699
2000	\$60,000 50%		\$64,639 54%		\$124,639
2001 \$0		0%	\$66,638	56%	\$66,638
2002 \$0		0%	\$68,699	57%	\$68,669
2003	\$50,000 42%		\$70,823 59%		\$120,823
2004 \$0		0%	\$73,014	61%	\$73,014
2005 \$0		0%	\$75,272	63%	\$75,272
2006 \$0		0%	\$77,600	65%	\$77,600
2007 \$0		0%	\$80,000	67%	\$80,000
Total	\$110,000		\$700,202		\$810,202

3.8. Investment Forecast





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3.9. Disposal Plan

It is expected that the Opsym assets will have no little or no material value upon the retirement. When the asset is decommissioned, an attempt will be made to sell the hardware on consignment through a third party vendor. No significant financial gain is expected.

Customary NSP accounting procedures will be used to retire the asset for accounting purposes.

3.10. Business Continuity Planning

There is no business continuity plan in place for the Opsym application.

4. Environmental Scan

The items listed below are the key environmental factors that influenced and lead to the recommendations and findings in this report.

4.1. Alignment with NSP IT strategic direction & architecture

The OPSYM environment is a client-side application that leverages data from a collection of locally installed databases and flat files. This is not aligned with NSP IT strategic direction nor is it supported by NSP IT.

4.2. Industry trends

There is increased scrutiny on the operating and trading decisions made by operators of generation fleets. The tools that are used are required to be more accurate, auditable and easier to use to enable both traditional operations staff and traders to utilize them. There is an increasing emphasis on managing the operations of a generation fleet within acceptable risk and profit criteria.

"Utilities are looking to make strategic decisions about their portfolio of assets, including how to operate generation as a fleet, how and when to invest in new assets and how and when to invest in existing assets within the context of real market conditions,"

Source:

http://www.ventyx.com/press/pr_detail.cfm?pr_id=385&qclid=COGI88uio5ECFRE_OAodyzmgfw

4.3. Vendor direction and support

Global Energy Decisions, the former vendor of Opsym, was acquired by Ventyx in June 2007 creating the world's largest privately held software provider to the utility industry. According to Ventyx, they will respond to Opsym related questions or reported issues indefinitely – as long as the client pays license fees. However, the Opsym product has reached its end-of-maintenance lifecycle and has been replaced by a new product, Generation Manager Resource Optimizer. Any Opsym reported issue that is code related, will not be fixed.



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Ventyx also acquired NewEnergy Associates (NEA) in September of 2007. NewEnergy is a provider of power market simulation, portfolio optimization, energy trading and risk management, and market operations solutions.

These acquisitions give Ventyx a number of offerings in the optimization genre. Gartner Research provides the following analysis:

This is a significant acquisition by Ventyx, demonstrating its commitment to the ETRM and power generation portfolio optimization market, which it recently entered via its June 2007 purchase of Global Energy Decisions (GED). Ventyx has quickly leapfrogged its ETRM competition with extensive commodity management functionality and an installed base for those products. Though NEA goes deeper into transmission planning simulation, gas portfolio optimization, financial analysis and retail market operation, the ETRM area has a significant overlap with the GED offering, which Ventyx will need to resolve.

Gartner Research, Ventyx Reinforces Market Position with NEA Acquisition, September 2007, ID G00151660

The following are Gartner recommendations for current Global Energy Decisions and NewEnergy Associates customers:

Current GED customers: *Ensure Ventyx continues to support GED software until an internal project can be scheduled, funded and resourced for an upgrade or conversion and for associated business process changes.*

Current NEA customers: *Ensure that Ventyx honors an "end of life" clause for NEA software. Press Ventyx to commit to a date for delivering a combined road map including transition plan, and insist that your input be considered.*

New customers considering Ventyx combined ETRM, planning and operations solutions: *Wait until Ventyx announces a product road map to ensure that schedules and functionality meet your needs. If you must proceed immediately, select GED's EnerPrise ETRM and NEA's PowerBase Suites and contractually enforce an option to switch the integrated products on your terms.*

Gartner Research, Ventyx Reinforces Market Position with NEA Acquisition, September 2007, ID G00151660

The full Gartner article is available as an attachment.

4.4.Licensing or contractual issues

There are no known compliance issues with the Opsym Software license.

4.4.1. Escrow Agreements

Escrow agreements protect Nova Scotia Power's interests by ensuring a third party has the source code for the application. In the case of bankruptcy or a dispute with the vendor, NSP would have the opportunity to access the code to support our business.



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Escrow Information

There is no escrow agreement in place with this vendor.

4.5.Change in the business environment

In the future, Nova Scotia Power expects to have to incorporate a significant volume of private sector generation into the dispatch model. As a result, there is an expected need for a flexible application that allows for both the number and type of generators to be easily added and modeled. Other business impacts include the implementation of a Fuel Adjustment Mechanism (FAM) for setting rates, the ability to audit, perform post dispatch analysis, provide reports and maintain historic data.

There is an expected requirement to do studies for longer intervals (3 months +) utilizing a number of different evaluation scenarios. The NSP version of Opsym is limited to runs of one month.

4.6.Changes that may require increased Security (Physical and Electronic)

There is little security in the NSP version of Opsym. There is no requirement for a user ID or password to gain access to the application. The data can be delegated by anyone with access to the local computer on which the application resides. A system where the data is backed up regularly and is restricted to specific users would ensure the data is available for audits and is more secure.

4.7.Top Issues with the Application

The following have been identified as the priority issues with the application or its environment.

- Opsym does not accurately model NSPI's electrical system, in particular, the various transmission constraints that exist from time to time. Transmission system modeling can be done in the current release, but at present is not. As a result, Commercial Operations are forced to rely on Excel spreadsheets to approximate the impacts of constraints.
- The lack of a relational database for the Opsym application makes retrieving or reviewing data challenging and makes auditing difficult. It takes significant effort to find and report on historical data generated by this system.
- Opsym has occasion to crash or lock-up due to the local workstation reaching disk capacity.
- Desktop level security on Opsym is lacking, no user ID or password is required to gain access to the application.
- The multiple Excel driven processes that support this application are considered a risk and would be better delivered as part of an application.
- The myriad of external processes required to sustain Opsym are dependant on the local area network. During periods of exceptional network traffic these processes, some of which are time sensitive, stall and cause the model to collapse and it often proves difficult to restart.



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- The set-up, technical and troubleshooting knowledge of the application is localized to one resource in Commercial Operations. NSP IT does not support this application
- Hourly and Day-Ahead schedules, which are sent daily to the regional ISO, are time consuming and cumbersome to produce. Complex Excel spreadsheets, along with Opsym, are required to produce these Dispatch Schedules.

5. Risks Assessment

The following risks have been identified with the Opsym environment.

- **Potential revenue loss.** A loss of the Opsym application could result in inaccurate RTP valuations or non-optimal fleet dispatch scenarios, both situations could be revenue affecting. Energy trading activities could also be impacted. Scheduling and post dispatch reconciliation of Brooklyn Power would also not be possible.
- **Operating efficiency loss.** Without Opsym, hourly and day-ahead dispatch schedules would be difficult to produce and scheduling of Brooklyn Power would not be possible.
- **Regulatory Risk.** A loss of the Opsym application would result in Commercial Operations being unable to produce the daily NPCC adequacy report for the regional control authority. This is a NERC requirement. Commercial Operations would also be unable to accurately determine hourly and day-ahead RTP prices for Stora and Bowater, a UARB requirement.

OVERALL SYSTEM RISK RATING: High

The High risk rating is derived from the moderate probability of a significant Opsym issue and the major impact of an Opsym issue on NSP operations.

6. Recommendations

The following is a list of recommendations based on the findings of the TAR. These recommendations are aimed at minimizing the risk to the business and maximizing the value of the asset. Costs identified with each recommendation are meant to be order of magnitude estimates only to enable Asset Owners to understand the scope of their investment decisions.

6.1. Develop a technology investment strategy for generation dispatch

The business owner should identify its business requirements, the subsequent technology required to support these requirements, and develop an investment plan for consideration by NSP senior management.

- | | |
|---|--|
| ☐ \$0 - \$5,000 | ☐ \$50,000 - \$100,000 |
| ☐ \$5,000 - \$10,000 | ☐ \$100,000 - \$250,000 |
| ☒ \$10,000 - \$50,000 | ☐ > \$250,000 |



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6.2. Develop an Application Service Level Agreement for Opsym

Develop an Application Service Level Agreement (SLA) with NSP IT for support of the application.

- | | |
|---|--|
| ☒ \$0 - \$5,000 | ☐ \$50,000 - \$100,000 |
| ☐ \$5,000 - \$10,000 | ☐ \$100,000 - \$250,000 |
| ☐ \$10,000 - \$50,000 | ☐ > \$250,000 |

6.3. Develop a Business Continuity Plan for Opsym-related business operations

A Business Continuity Plan will provide contingency for circumstances when Opsym is not available.

- | | |
|---|--|
| ☒ \$0 - \$5,000 | ☐ \$50,000 - \$100,000 |
| ☐ \$5,000 - \$10,000 | ☐ \$100,000 - \$250,000 |
| ☐ \$10,000 - \$50,000 | ☐ > \$250,000 |

6.4. Develop an operational maintenance plan for Opsym

A series of regular scheduled system health checks should be developed to mitigate the risk of system failure.

- | | |
|---|--|
| ☒ \$0 - \$5,000 | ☐ \$50,000 - \$100,000 |
| ☐ \$5,000 - \$10,000 | ☐ \$100,000 - \$250,000 |
| ☐ \$10,000 - \$50,000 | ☐ > \$250,000 |

7. Next Asset Review Date

Based on the current state of this asset, pace of change in the business, industry and technology, we recommend that this Technology Asset Review be scheduled again for Q1 2009.



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8. Appendices

8.1.APPENDIX A - SECURITY CONTROLS BASELINE CHECKLIST

The purpose of the following questions is to provide a basic example of the type of questions that should be asked concerning Security (physical and electronic) for the systems identified in this TAR. **This is not a comprehensive risk assessment but is designed to provide a baseline for a discussion with the systems owner.**

The questions are worded to require one of three possible answers, Yes, In progress (IP), or No. Responses indicating NO or IP should alert the person performing the risk assessment that a higher lever of risk may exist for the systems identified in the TAR.

YES = Already exists

IP = In progress

NO = Does not exist

QUESTION	YES	IP	NO
Is the current system configurations documented, including links to other systems?			X
Does application adhere to password lifetime policy of 30 days?		X	
Do logical access controls restrict users to authorized transactions and functions?			X
Are critical security patches being installed to the application?			X
Are critical security patches being installed to the underlying infrastructure (database operating system, etc)?	X		
Does the vendor support the current application version?	X		
Are intrusion detection tools installed on the system?	X		
Are tests and examinations of key controls routinely made (network scans, analysis of accesses, etc)?			X
Are security alerts and security incidents analyzed and remedial actions taken?			X
Does management ensure that corrective actions are effectively implemented?			X
Is virus detection and elimination software installed and activated?	X		
Are virus signature files routinely updated?	X		
Have adequate physical security controls been implemented that are commensurate with the risk of physical damage or access?	X		
Is access of facilities controlled through the use of guards, identification badges, or entry devices such as key cards?	X		



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QUESTION	YES	IP	NO
Does management regularly review the list of persons with physical access to sensitive facilities?	X		

8.2. APPENDIX B - CONTINUITY RISK MITIGATION CHECKLIST

The purpose of the following questions is to provide a basic example of the type of questions that should be asked concerning contingency risk mitigation strategies for the systems identified in this TAR. **This is not a comprehensive continuity risk assessment but is designed to provide a baseline for a discussion with the systems owner**

The questions are worded to require one of three possible answers, Yes, In progress (IP), or No. Responses indicating NO or IP should alert the person performing the risk assessment that a higher lever of risk may exist for the systems identified in the TAR.

YES = Already exists

IP = In progress

NO = Does not exist

QUESTION YE	S	IP	NO
Are appropriate fire suppression and prevention devices installed and working?	X		
Are fire ignition sources, such as failures of electronic devices or wiring, improper storage materials, and the possibility of arson, reviewed periodically?	X		
Are heating and air conditioning systems regularly maintained?	X		
Is there a redundant air cooling system? (Ex: MCC has a redundant AC system. Communication closets in Barrington Tower do not)	X		
Has an uninterruptible power supply or backup generator be provided?	X		
Have the critical data files and operations been identified and the frequency of file backup documented?			X
Have resources supporting this critical operation been identified?			X
Are backup files created on a prescribed basis and rotated off-site often enough to avoid disruption if current files are damaged?			X
Are backup files maintained at a secondary site?			X
Are duplicate program files, source code, etc. included in an off-site storage facility? (Ex: If system backed up and tapes stored off site – YES)			X
Are duplicate copies of documentation maintained?			X
Are copies of documentation stored off-site?			X
Are backup copies of documentation reviewed periodically to assure currency?			X



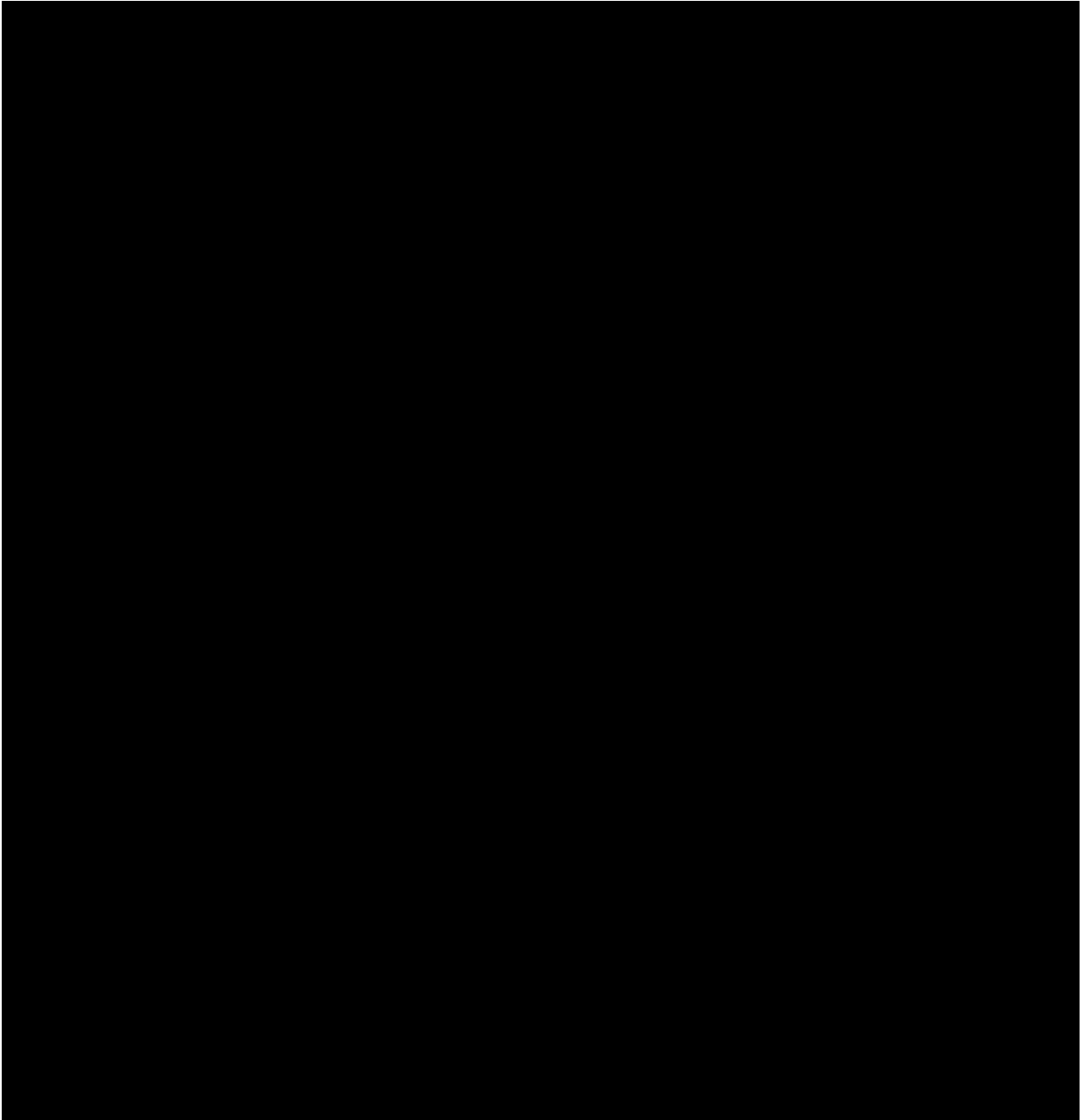
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QUESTION YE	S	IP	NO
Is there a formal, written disaster recovery plan? (If you answer "NO" to this question, DO NOT complete the rest of the checklist.)			X
Has the disaster recovery plan been tested?			X



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8.3. APPENDIX C – RISK ASSESSMENT CHART





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8.4. APPENDIX D – SEVERITY RATINGS

Using the Keys described on the next two pages please rate the “IMPACT” to your business of the loss of or loss of control over the Information Asset Group identified above and the “PROBABILITY” of this risk occurring.

IMPACT KEYS – SEVERITY RATINGS

The level to which the risk would affect the ability of the business to deliver its strategy and objectives:

- **Financial Perspective** - Impact on investor confidence; growth in new business; attract and manage strategic partnerships
- **Customer Perspective** – Impact on customer loyalty; customer growth and retention; service reliability
- **Internal Processes** – Impact on the environment; operating efficiency; development of innovative customer offerings; capital utilization
- **People and Learning** – Impact on safety; employee commitment and competency

SEVERITY SCORE	RATING	DESCRIPTION
1	Insignificant	
2	Minor	No material impact on the achievement of business strategy and objectives Slight adverse variances may require inclusion in monthly report.
3	Moderate	Disruption to normal with a limited effect on achievement of business strategy and objectives - Temporary (Less than 3 months) loss of production & distribution/supply chains - Correctable product quality impact - Loss of assets
4	Major	Reduced ability to achieve business objectives - Loss of key customers, customer loyalty and sales opportunities - Significant but recoverable reduction in company credibility and/or reputation - Significant reduction in service reliability - Incurring excessive costs which impact ongoing profitability - Permanent reduction in product or service quality - Loss or misappropriation of significant assets



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5	Catastrophic	Loss of ability to sustain ongoing operations. A situation that would cause a standalone business to cease operating • Loss of significant (50% or more) production capability • Massive reduction in company credibility with shareholders, customers, suppliers, staff and public (usually linked to some major incident) • Loss of 2 or more significant customers • \$10M reduction in net earnings • Loss of key competitive advantage/opportunity • Loss of supply of key process inputs
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PROBABILITY KEYS - SEVERITY RATINGS

To rate the Probability that the risk will occur please refer to your ratings in section 8 the "Asset State" section of this TAR. Based on the risks identified there you can estimate your probability by considering the following information:

PROBABILITY SCORE	RATING	DESCRIPTION
1	Rare	Risk has a less than 10% probability of occurring
2	Unlikely	Risk has a greater than 10% probability of occurring
3	Moderate	Risk has a greater than 25% probability of occurring
4	Likely	Risk has a greater than 50% probability of occurring
5	Common	Risk has a greater that 80% probability of occurring



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8.5. APPENDIX E – SCOPE DETAILS

IN SCOPE

The following assets and components were considered within in the scope of this TAR:

- Production workstations
- Operating system software
- Application software
- Database software

OUT OF SCOPE

The following assets and components were specifically considered as not within the scope of this TAR.

- User knowledge and training
- Network infrastructure



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Boundary Diagram

